

WHAT IS CLAIMED IS:

1. A method comprising:
 - a) obtaining a peptide or protein that selectively binds to prostate cancer tissue;
 - b) attaching an agent to the peptide or protein to form a complex; and
 - c) exposing the complex to a sample suspected of containing prostate cancer cells.
2. The method of claim 1, further comprising administering the complex to a human subject.
3. The method of claim 1, wherein the sample is a thin section of a tissue.
4. The method of claim 1, wherein the peptide or protein is a targeting peptide.
5. The method of claim 1, wherein the peptide or protein is an antibody.
6. The method of claim 5, wherein the antibody binds to GRP78, hsp90 α or IL-11R α .
7. The method of claim 5, wherein the antibody binds to a peptide comprising at least 3 contiguous amino acids of a sequence selected from any of SEQ ID NO:39 through SEQ ID NO:67.
8. The method of claim 5, wherein the antibody binds to an amino acid sequence selected from SEQ ID NO:39.
9. The method of claim 5, wherein the antibody binds to an amino acid sequence selected from SEQ ID NO:42.
10. The method of claim 5, wherein the antibody binds to an amino acid sequence selected from SEQ ID NO:46.
11. The method of claim 1, further comprising detecting prostate cancer cells in said sample.

12. The method of claim 11, further comprising detecting metastatic prostate cancer in bone marrow.
13. The method of claim 1, further comprising diagnosing prostate cancer.
14. The method of claim 1, further comprising providing a prognosis for an individual with prostate cancer.
15. The method of claim 4, wherein the targeting peptide comprises at least three contiguous amino acids of a sequence selected from any of SEQ ID NO:5 through SEQ ID NO:35, SEQ ID NO:37 or SEQ ID NO:83 through SEQ ID NO:129.
16. The method of claim 15, wherein the targeting peptide has an amino acid sequence selected from SEQ ID NO:34, SEQ ID NO:37, SEQ ID NO:83 or SEQ ID NO:84.
17. The method of claim 1, wherein the agent is a therapeutic agent or an imaging agent.
18. The method of claim 17, wherein the therapeutic agent is a drug, a chemotherapeutic agent, a radioisotope, a pro-apoptosis agent, an anti-angiogenic agent, a survival factor, an anti-apoptotic agent, an enzyme, a hormone, a hormone antagonist, a cytokine, a cytotoxic agent, a cytotoxic agent, a cytostatic agent, a growth factor, a peptide, a protein, an antibiotic, an antibody, a Fab fragment of an antibody, a hormone antagonist, a nucleic acid, an antigen, a virus, a bacteriophage, a bacterium, a liposome, a microparticle, a magnetic bead, a microdevice, a yeast cell, a mammalian cell, a cell or an expression vector.
19. The method of claim 18, wherein the pro-apoptosis agent is selected from the group consisting of gramicidin, magainin, mellitin, defensin, cecropin, (KLAKLAK)₂ (SEQ ID NO:1), (KLAKKLA)₂ (SEQ ID NO:2), (KAAKKAA)₂ (SEQ ID NO:3) and (KLGKKLG)₃ (SEQ ID NO:4).
20. The method of claim 19, wherein the pro-apoptosis agent is (KLAKLAK)₂ (SEQ ID NO:1).
21. The method of claim 18, wherein the anti-angiogenic agent is selected from the group consisting of thrombospondin, angiostatin, pigment epithelium-derived

factor, angiotensin, laminin peptides, fibronectin peptides, plasminogen activator inhibitors, tissue metalloproteinase inhibitors, interferons, interleukin 12, platelet factor 4, IP-10, Gro- β , thrombospondin, 2-methoxyoestradiol, proliferin-related protein, carboxiamidotriazole, CM101, Marimastat, pentosan polysulphate, angiopoietin 2 (Regeneron), interferon- α , herbimycin A, PNU145156E, 16K prolactin fragment, Linomide, thalidomide, pentoxifylline, genistein, TNP-470, endostatin, paclitaxel, Docetaxel, polyamines, a proteasome inhibitor, a kinase inhibitor, a signaling peptide, accutin, cidofovir, vincristine, bleomycin, AGM-1470, platelet factor 4 and minocycline.

22. The method of claim 18, wherein said cytokine is selected from the group consisting of interleukin 1 (IL-1), IL-2, IL-5, IL-10, IL-11, IL-12, IL-18, interferon- γ (IF- γ), IF- α , IF- β , tumor necrosis factor- α (TNF- α), or GM-CSF (granulocyte macrophage colony stimulating factor).

23. The method of claim 18, further comprising:

- a) administering the complex to an individual with prostate cancer; and
- b) treating the prostate cancer.

24. A composition comprising an adeno-associated phage (AAP).

25. The composition of claim 24, wherein the AAP is a gene therapy vector.

26. The composition of claim 25, wherein the AAP comprises a nucleic acid encoding a therapeutic protein.

27. The composition of claim 26, wherein the nucleic acid encodes a cytotoxic agent, a cytostatic agent, a cytocidal agent, a pro-apoptosis agent, an anti-angiogenic agent, a hormone, a cytokine or an enzyme.

28. The composition of claim 27, wherein the nucleic acid encodes thymidine kinase.

29. The composition of claim 25, wherein the AAP comprises a nucleic acid encoding a targeting peptide.

30. The composition of claim 29, wherein the nucleic acid encodes an amino acid sequence selected from the group consisting of GFE, HWGF and RGD-4C.

31. The composition of claim 29, wherein the nucleic acid encodes at least three contiguous amino acids selected from any of SEQ ID NO:5 through SEQ ID NO:35, SEQ ID NO:37, SEQ ID NO:82 through SEQ ID NO:129 or SEQ ID NO:132.

32. The composition of claim 31, wherein the nucleic acid encodes at least three contiguous amino acids selected from the group consisting of SEQ ID NO:34, SEQ ID NO:37, SEQ ID NO:83 and SEQ ID NO:84.

33. A method of treating a disease state comprising administering a composition comprising an adeno-associated phage to an individual with a disease.

34. The method of claim 33, wherein the disease is prostate cancer.

35. The method of claim 33, wherein the disease is metastatic cancer.

36. An isolated peptide of 100 amino acids or less in size, comprising at least 3 contiguous amino acids of a sequence selected from any of SEQ ID NO:83 through SEQ ID NO:129 or SEQ ID NO:132.

37. The isolated peptide of claim 36, wherein said peptide is 25 amino acids or less in size.

38. The isolated peptide of claim 36, wherein said peptide is 10 amino acids or less in size.

39. The isolated peptide of claim 36, wherein said peptide is 7 amino acids or less in size.

40. The isolated peptide of claim 36, wherein said peptide comprises at least 5 contiguous amino acids of a sequence selected from any of SEQ ID NO:83 through SEQ ID NO:129 or SEQ ID NO:132.

41. The isolated peptide of claim 36, wherein said peptide is attached to a molecule.

42. The isolated peptide of claim 41, wherein said molecule is a drug, a chemotherapeutic agent, a radioisotope, a pro-apoptosis agent, an anti-angiogenic agent,

a hormone, a cytokine, a growth factor, a cytotoxic agent, a peptide, a protein, an antibiotic, an antibody, a Fab fragment of an antibody, an imaging agent, survival factor, an anti-apoptotic agent, a hormone antagonist or an antigen.

43. The isolated peptide of claim 36, wherein said peptide is attached to a macromolecular complex.

44. The isolated peptide of claim 43, wherein said complex is a virus, a bacteriophage, a bacterium, a liposome, a microparticle, a magnetic bead, a yeast cell, a mammalian cell or a cell.

45. The isolated peptide of claim 43, wherein said peptide is attached to a eukaryotic expression vector.

46. The isolated peptide of claim 45, wherein said vector is a gene therapy vector.

47. The method of claim 2, further comprising targeting delivery of said agent to an organ, tissue or cell type in said subject.

48. A method of treating a lipoma comprising:

- a) obtaining a targeting peptide selective for adipose tissue;
- b) attaching the peptide to a therapeutic agent to form a complex;
- c) administering the complex to a subject; and
- d) treating a lipoma.

49. The method of claim 48, wherein the targeting peptide comprises at least three contiguous amino acids of a sequence selected from SEQ ID NO:72, SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, SEQ ID NO:77, SEQ ID NO:78, SEQ ID NO:79, SEQ ID NO:80, SEQ ID NO:81 or SEQ ID NO:82.

50. The method of claim 49, wherein the targeting peptide has the amino acid sequence of SEQ ID NO:77, SEQ ID NO:81 or SEQ ID NO:82.

51. A method comprising:

- a) obtaining a peptide or protein that selectively binds to ovarian cancer tissue;

- b) attaching an agent to the peptide or protein to form a complex; and
- c) exposing the complex to a sample suspected of containing ovarian cancer cells.

52. The method of claim 51, further comprising administering the complex to a human subject.

53. The method of claim 51, wherein the sample is a thin section of a tissue.

54. The method of claim 51, wherein the peptide or protein is an antibody.

55. The method of claim 51, wherein the antibody binds to a peptide with a sequence comprising at least 3 contiguous amino acids selected from SEQ ID NO:132.

56. The method of claim 6, further comprising categorizing a prostate cancer as androgen-dependent or androgen-independent.

57. The method of claim 56, wherein said categorizing is based on the expression of IL-11R α in the blood vessels of said prostate cancer.